

## CLAIMS

What is claimed is:

1. A high frequency transducer, comprising:
  - a first diaphragm having a first coil thereon;
  - a second diaphragm having a second coil thereon formed on a periphery of said first diaphragm;

5           a first seat having a first magnet structure, said first seat defining an annular opening to allow said second coil to be moveably suspended therein; and

              a second seat having a second magnet structure, said second seat and said second magnet defining an annular gap to allow said first coil to be moveably suspended therein.

2. The invention of Claim 1, wherein said first and second magnets are substantially disk shaped.

3. The invention of Claim 1, wherein said first and second magnets are substantially flat in structure.

4. The invention of Claim 2, wherein said first magnet and said second magnet can be magnetized after assembly.

5. The invention of Claim 2, wherein said first magnet and said second magnet can be magnetized simultaneously after assembly.

6. The invention of Claim 2, wherein said first magnet and said second magnet have similar polarity.

7. The invention of Claim 2, wherein said first and second magnets are neodymium iron boron magnets.

8. The invention of Claim 2, wherein said second seat is positioned on said first seat to enclose said first magnet therein but does not occlude said annular opening.

9. The invention of Claim 8, wherein a disk shaped plate is placed on said second magnet and does not occlude said annular gap.

10. The invention of Claim 9, wherein a substantially annular wall extends from an outer periphery of said second seat to encompass said second magnet and said plate.

11. The invention of claim 10, wherein a lip extends inwardly to define said gap between said lip and said plate.

12. The invention of Claim 2, wherein said annular gap contains a substance having high heat transfer capability.

13. The invention of Claim 12, wherein said substance is a metallic fluid and is injected into said annular gap.

14. The invention of Claim 13, wherein said metallic fluid is a ferrofluid and is injected into said annular gap.

15. A high frequency loud speaker, comprising:

a first diaphragm having a first coil thereon;

a second diaphragm having a second coil thereon formed on a periphery of said first diaphragm;

5           a first seat having an annular first wall extending therefrom and encircling a first magnet having a flat structure therein, said first wall and said first magnet defining an annular opening therebetween to allow said second coil to be moveably suspended therein; and

              a second seat having a second annular wall extending therefrom and encircling a second magnet having a flat structure, said second wall and said second magnet defining an annular gap to allow said first coil to be moveably suspended therein.

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16. The invention of Claim 15, wherein said first and second magnets have a substantially disk shaped structure.

17. The invention of Claim 16, wherein said second seat is positioned on said first seat to enclose said first magnet therein but does not occlude said annular gap.

18. The invention of Claim 17, wherein said first and second magnets are magnetized after said second seat is positioned over said first seat.

19. The invention of Claim 18, wherein a plate is concentrically placed upon said second magnet, and said plate also accommodates a domed diaphragm thereon on a side opposing said second magnet.

20. A high frequency transducer, comprising:

a first dome shaped diaphragm having a first coil thereon;

5 a second conical diaphragm having a second coil thereon formed on a periphery of said first diaphragm;

a first seat having a first disk shaped magnet, said first seat and said magnet defining an annular opening to allow said second coil to be moveably suspended therein;

at least an aperture being defined through said first seat and being position between said first magnet and said first seat;

10 a second seat having a second magnet structure, said second seat and said second magnet defining an annular gap to allow said first coil to be moveably suspended therein;

said second seat being positioned over said first seat to encompass said first magnet therein without occluding said annular opening;

15 at least a void being defined through said second seat, said void being in substantial axial alignment with said aperture;

at least an electrical conducting element passing through said void and said aperture; and

said first and second magnets being magnetized simultaneously after assembly of said high frequency transducer.